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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,124	01/20/2004	Olav Finkenwirth	NOS-102	8794

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EXAMINER	
WANG, EUGENIA	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
03/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/761,124	FINKENWIRTH ET AL.	
	Examiner	Art Unit	
	EUGENIA WANG	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *1-23 and 35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 3, 2009 has been entered.

Response to Amendment

2. In response to the amendment:

a. Claims 1-35 are pending, with claims 1-23 and 35 withdrawn as being drawn to a non-elected invention.

b. The previous 112 rejection of record has been withdrawn in light of the amendment.

c. The rejections with respect to US 4937152 (Sato et al.) alone have been withdrawn in light of the amendment. However, some portions of the 103 rejection with respect to Sato et al. as combined with JP 63-285873 (Arima) have been maintained (and expanded upon with receipt of the certified translation). New prior art has been added to reject the claims, as necessitated by the amendment.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 24-29 and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of JP 63-285873 (Arima) and either US 2001/0044043 (Badding et al.) or the admitted prior art (APA), as evidenced by The Fuel Cell Handbook (FCH).

As to claim 24, Sato et al. teach a fuel cell with a solid electrolyte [5], in wherein the electrolyte [5] in combination with spacer [10] is interpreted as the at least dual layered sealing structure, as two different layers are present (col. 4, lines 52-54; fig. 2(c)). Furthermore, it is noted that the sealing structure (spacer [10] with the electrolyte [5]) extends between two separators [3], as the structure as a whole extends between the two separators. The electrolyte [5] is seen as the insulating layer of the sealing structure, wherein the electrolyte [5] layer is applied to both the separator [3] and fuel cell via air electrode [4], wherein the electrolyte [5] sits directly on a separator (fig. 2(a); fig. 2(c)). As seen in fig. 2c, electrolyte layers lie between adjacent separators. The spacer [10] is interpreted to be the sealing layer, as it has sealing properties (since fuel and air paths are formed in it and delivered to the fuel cell, and thus it must have some sort of sealing property, as it limits the reactant flow to the paths formed within it) (fig. 2(c)). The spacer [10] is indicated to be a different material than that of the electrolyte, as the cross-hatching in fig. 2(c) is different for the spacer [10] and the electrolyte [5]. (It is noted that the structure of fig. 2(c) inherently includes the method of forming it, and

thus includes applying the insulating (electrolyte [5]) layer and sealing layer (spacer [10]).

Sato et al. do not teach (a) that the insulating layer (electrolyte) is arranged between the sealing layer (spacer [10]) and the separator that it is applied to or (b) that the sealing layer (spacer [10]) is in the form of a paste or solubilized foil.

As to (a), Arima teaches a molten carbonate fuel cell (as the electrolyte is a carbonate substance), wherein the electrolyte [1] that is extended across the fuel and oxidant gas inlets (fig. 2; p 2, lines 13-15). It is noted what Armia specifically teaches is that a material with excellent heat conduction and insulation property can be used at the peripheral portion of the electrolyte plate (near the reactant inlet/outlet portion) can minimize the temperature differential across the fuel cell electrolyte (p 3, last two lines to p4, line 8). Specifically, ceramic [5] at the edge portions [1a, 1b] is embodied (p5, lines 3-6). (At this point, the FCH is relied upon to show that solid oxide fuel cell electrolytes are ceramic materials, wherein yttria stabilized zirconia (Y_2O_3-stabilized ZrO_2) is particularly mentioned to be an electrolyte, and thus is a ceramic) (see p 1-4 under the TSOFC; and table 1-1 (ITSOFC and TSOFC) on p 1-5).) Accordingly Arima's base teaching is that including ceramic materials that extend around the inlet and outlet portions of the reactant can help keep a temperature distribution within the electrolyte uniform, thus prolonging the lifetime of the electrolyte (p 6, lines 6-8). Thus, the motivation for extending the ceramic electrolyte (insulating layer) of Sato et al. in the manner taught by Arima (across the inlet and outlet manifolds) is to impart good insulting capability and high heat conductivity, which reduces the adverse effect of a

temperature differential between the gas inlet and outlet and the central portion of the electrolyte plate (abs; p6, liens 6-8). (It is noted that although Arima's electrolyte material is drawn to something different than that of Sato et al., it does not negate the base teaching, which is that ceramic materials extended across the inlet/outlet manifolds help keep temperature differences small throughout the electrolyte. And accordingly, the extension of the electrolyte of Sato et al., which is a ceramic, would yield the predictable result of also helping dissipate heat evenly through the system.) Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to extend the (ceramic) electrolyte plate of Sato et al. across the spacer [10] (indicative of the inlet/outlet portions of the fuel and oxidant) with an additional (ceramic) heat conductive layer, as taught by Arima in order to achieve high insulating capability and high heat conductivity, which helps alleviate the adverse affect of having a temperature differential across the electrolyte (wherein the extension of the ceramic electrolyte of Sato et al. would yield the predictable result of having such a characteristic).

As to (b), Badding et al. teach of a solid oxide fuel cell (abs). Specifically, Badding et al teach that a stainless steel ceramic composite paste can be used as a seal to prevent fuel from leaking from the system (para 0062). Accordingly, the motivation for using such a paste material for a sealing material (i.e. the spacer of Sato et al.) is in order to ensure that reactant does not leak from the system. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to make the spacer of Sato et al. (or at the very least to use such a

material at the edge portion of the spacer), in order to ensure fuel reactant delivery to the fuel cell without leaking. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a paste, as taught by Badding, as the material that seals the fuel cell of Sato et al., since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416. Lastly, it is noted that at the very least the use of the sealing paste, as specified by Badding et al. as the spacer [10] of Sato et al. would yield the predictable result of acting in the same manner, to guide reactant flow without leakage within the system. Therefore. it would have furthermore been obvious to one of ordinary skill in the art at the time the invention was made to make the spacer of Sato et al. using the material of Badding et al., as it would have yielded the predictable result of acting in the same manner.

Alternately, as to (b), the APA can be relied upon. Specifically, the APA teaches it is known to use paste or solubilized foil as sealing material (see p4 and fig. 2 of the Specification of the instant application). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a paste or solubilized foil, as taught by the APA, as the material of Sato et al.'s spacer (as both the sealing layer [14] of the APA and the spacer [10] of Sato et al. correspond to one another, as both seal the fuel cell and deliver reactants), since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

Lastly, it is noted that at the very least the use of such a material (paste/solubilized foil), as specified by the APA as the spacer [10] of Sato et al. would yield the predictable result of acting in the same manner, to act as a spacer member that would be able to guide reactants. Therefore. it would have furthermore been obvious to one of ordinary skill in the art at the time the invention was made to make the spacer of Sato et al using the material taught by the APA, as it would have yielded the predictable result of acting in the same manner.

As to claims 25-27, Sato et al. teach that the electrolyte layer [5] (which also serves as the insulating layer) can be formed using plasma thermal spraying (col. 3, lines 61-68).

As to claims 28, 29, 32, and 33, since the electrolyte [5] of Sato et al. serves as the insulating layer, its application is done simultaneously in one process step (as applied to claims 28, 29, and 33). It is noted that since the electrolyte [5] is formed on an air electrode [4], the air electrode must be formed prior to applying the insulating layer (electrolyte [5]) (as applied to claim 28) (col. 3, lines 61-68). Additionally, the plasma coating nozzle would inherently extend to a certain displacement area in order to apply the electrolyte layer and the insulating area, where the nozzle is extended to a point that it covers all required sealing locations (as applied to claims 32 and 33).

As to claim 31, Sato et al.'s fig. 2c shows the fuel cell member [1] (as seen in fig. 2a) as a stack. The fuel cell is a solid oxide fuel cell, as indicated by the yttria-stabilized zirconia electrolyte (col. 3, lines 61-63).

As to claim 34, it is inherent to Sato et al.'s fuel cell stack that the sealing layer (spacer [10]) is applied after insulating layer (electrolyte [5]).

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that any other method would not yield the structure of Sato et al. The inherency of this method is evidenced by the fact that single fuel cells (which requires the depositing of insulating layer (electrolyte [5]) are made before a stack is made) (col. 1, lines 17-45; fig. 2(a); fig. 2(c)). Accordingly, the stacks are formed after the individual fuel cells are formed, and thus the spacers (sealing layer [10]) must be applied after the application of the electrolyte.

The Examiner requires applicant to provide that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

5. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of Arima, as applied to claim 24, in view of US 5603875 (Giller et al.).

Sato et al. does not teach that one predetermined sealing area of at least one separator plate is roughened prior to being coated with the insulating layer.

Giller et al. teaches the deposition of a zirconia (wherein yttria stabilized zirconia is one embodiment, the same substance as the electrolyte [5] of Sato et al.) substance by plasma deposition (the same method used in Sato et al.), wherein the surface of the substrate that is to receive the plasma deposition is roughened (col. 4, lines 36-46; col. 5, lines 20-43). The motivation for wanting to roughen the surface of the substrate prior to applying plasma stray deposition is to promote adhesion and bounding of the solid zirconia layer (layer that is being deposited) (col. 5, lines 40-43). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to want to roughen at least one predetermined sealing area of at least one separator plate (i.e. the substrate as referred to by Giller et al.) in Sato et al. prior to plasma spraying the zirconia in order to promote adhesion and bounding of the zirconia layer. (It is noted that although Giller et al. is not drawn to a solid oxide fuel cell

like Sato et al., the process (plasma spraying) and the material (zirconia, especially yttria stabilized zirconia) is the same. Accordingly, Giller et al. teaches of solving a problem that is associated with applying zirconia via plasma spraying. In this manner, Giller et al. can be combined with Sato et al., as it solves the same problem: providing better adhesion and binding via the process.)

Response to Arguments

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

It is first noted that the 102 and 103 rejections with respect to Sato et al. alone have been withdrawn in light of the amendment. It is noted that the amendment with respect to the placement of the insulating material (electrolyte) being directly placed on the separator distinguishes it from the previous rejections of Sato et al. alone.

A rejection wherein a combination of Sato et al. and Arima (now with Badding et al. and the FCH) is still applied, wherein Examiner would like to take the opportunity to address the pertinent issues as to the combination of Sato et al. and Arima, as set forth in Applicant's response.

Applicant argues that only Arima's abstract and figures have been relied upon, and thus it is unclear whether on not the electrolyte extends to the inlets and outlets.

Examiner respectfully disagrees. A full translation of Arima has been provided with this action, wherein the teaching of Arima (as set forth in the rejection) is to the fact that ceramic materials (as is the electrolyte material of Sato et al.) when extended to the inlets and outlets would provide good heat conduction throughout the system.

Accordingly, it has been set forth that the extension of the electrolyte of Sato et al would be obvious to one of ordinary skill in the art at the time the invention was made for such a reason. Please see the rejection above for full details as to how Arima renders obvious such a feature. Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that there is no suggestion or motivation to modify Sato et al. to rearrange the layers in Sato et al. to have an insulating layer that is directly applied to the sealing area of a separator.

Examiner respectfully disagrees with Applicant's position. It is submitted that figs. 2(a) and 2(c), which is relied upon for this rejection, that a portion of the electrolyte [5] (insulating material) is directly placed against the separator [3]. Accordingly, no rearrangement of the layers is necessary. Furthermore, as set forth in the rejection, Arima renders obvious the extension of the electrolyte (insulating material) for thermal conductive reasons. Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that there is no suggestion or motivation to use a paste or solubilized foil as a spacer material (of Sato et al.)

Examiner respectfully disagrees. Badding et al. is used to render obvious the use of a paste as a sealing material (which is what spacer [10] if Sato et al. is - a sealing material), as set forth in the rejection. Examiner would also like to submit that it is uncertain as to why the use of such materials would not be within the skill of the ordinary artisan, as Applicant admits that such materials are known in the art (see p4,

lines 2-5). Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that Giller et al. does not overcome the above deficiencies.

Examiner respectfully disagrees. As addressed above, such alleged deficiencies do not exist. Accordingly, the rejection of record is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795